# Claims

What is claimed is:

1. A vacuum chamber comprising:
   a. chamber walls surrounding a chamber interior;
   b. a port defined in the chamber walls, the port opening between the chamber interior and a chamber exterior;
   c. a viewing tube:
      i. extending from the port into the chamber interior, and
      ii. being closed by a window situated within the chamber interior, the window being at least partially transparent.

2. The vacuum chamber of claim 1 further comprising:
   a. a track fixed with respect to the port;
   b. a positioner carriage movable along the track;
   c. a positioner subcarriage movably affixed to the positioner carriage; and
   d. an imaging device on the positioner subcarriage, the imaging device being at least partially situated within the viewing tube and the chamber interior.

3. The vacuum chamber of claim 2 wherein the track is arcuate, with a center of curvature situated within the chamber interior.

4. The vacuum chamber of claim 1 further comprising:
   a. an imaging device; and
   b. an imaging device positioner movably mounting the imaging device at least partially within the viewing tube and the chamber interior.

5. The vacuum chamber of claim 4 wherein the imaging device positioner includes:

a. an arcuate track fixed with respect to the port;

b. a positioner carriage movable along the track; and

c. a positioner subcarriage whereupon the imaging device is situated, the positioner subcarriage being movably affixed to the positioner carriage.

6. The vacuum chamber of claim 5 wherein the arcuate track has a center of curvature situated within the chamber interior.

7. The vacuum chamber of claim 5 wherein the positioner carriage includes wheels engaging opposing sides of the track.

8. The vacuum chamber of claim 7 wherein the positioner carriage further includes a pinion engaging the track.

9. The vacuum chamber of claim 5 wherein one or more springs are interposed between the positioner carriage and positioner subcarriage, and wherein the springs bias the positioner carriage and positioner subcarriage apart.

10. The vacuum chamber of claim 9 further comprising one or more threaded members extending between the positioner carriage and positioner subcarriage, wherein rotation of the threaded members repositions the positioner subcarriage with respect to the positioner carriage.

11. The vacuum chamber of claim 5 wherein:

a. the positioner carriage moves along the track in a carriage plane;

b. the positioner subcarriage is movable with respect to the positioner carriage:

i. in a first plane oriented at least substantially perpendicular to the carriage plane; and

ii. in a second plane oriented at least substantially parallel to the carriage plane.

12. The vacuum chamber of claim 5 wherein:

a. the positioner carriage moves along the track in a carriage plane, and

b. a first threaded member extends between the positioner subcarriage and the positioner carriage, and rotation of the first threaded member moves the positioner subcarriage relative to the positioner carriage in a direction at least substantially perpendicular to the carriage plane.

13. The vacuum chamber of claim 12 further comprising a second threaded member extending between the positioner subcarriage and the positioner carriage, wherein rotation of the second threaded member moves the positioner subcarriage relative to the positioner carriage in a direction at least substantially parallel to the carriage plane.

14. The vacuum chamber of claim 5 further comprising:

a. one or more springs interposed between the positioner carriage and positioner subcarriage, wherein the springs bias the positioner carriage and positioner subcarriage apart; and

b. one or more threaded members extending between the positioner carriage and positioner subcarriage, wherein rotation of the threaded members repositions the positioner subcarriage with respect to the positioner carriage.

15. The vacuum chamber of claim 1 wherein the viewing tube includes a flange removably affixed to the port, whereby the viewing tube may be removed from the port.

16. The vacuum chamber of claim 1 wherein the viewing tube includes:

a. an interior end situated within the chamber interior, wherein the window is situated at or immediately adjacent to the interior end; and

b. an exterior end opposite the interior end and situated outside the chamber interior, the exterior end bearing an outwardly-extending flange removably affixed to the port, whereby the viewing tube may be removed from the port.

17. The vacuum chamber of claim 1 wherein the entirety of the viewing tube extends between:

a. a circumferential flange affixed to the port, and

b. the window.

18. The vacuum chamber of claim 1 wherein the viewing tube decreases in diameter between the port and the window.

19. The vacuum chamber of claim 1 further comprising a microscope situated within the chamber interior and spaced from the viewing tube.

20. The vacuum chamber of claim 19 wherein the microscope is an atom probe microscope.